E\PCOS 2022
EUROPEAN PHASE-CHANGE AND OVONIC SYMPOSIUM
~ OXFORD, UK ~ 18 TO 21 SEPTEMBER ~

Programme - Monday 19 September 2022

All timings are in local British Summer Time (BST)

08:00-09:00 REGISTRATION + MORNING REFRESHMENTS

09:00-09:15 **OPENING REMARKS**

SESSION 1 – PHOTONICS 1

09:15-10:15 Ovshinsky Award: Harish Bhaskaran – University of Oxford, United Kingdom
Ovshinsky Award: David Wright – University of Exeter, United Kingdom

10:15-10:30 Mengyun Wang – University of Oxford, United Kingdom
Reconfigurable metasurfaces using lossless phase-change material

10:30-10:45 Euan Humphreys – University of Exeter, United Kingdom
Filtering and Modulation from Visible to Terahertz using Phase-Change Extraordinary Optical Transmission Metasurfaces

10:45-11:20 COFFEE BREAK

SESSION 2 – PHOTONICS 2

11:20-11:45 Invited Speaker: Arka Majumdar – University of Washington, USA

11:45-12:00 June Sang Lee – University of Oxford, United Kingdom
Polarization-selective tunability in hybrid phase-change nanowires

12:00-12:15 Zhuoran Fang – University of Washington, USA
Ultra-low energy programmable non-volatile silicon photonics based on graphene heaters

12:15-12:30 Daniel Yimam – University of Groningen, The Netherlands
Structural colors and enhanced resolution at the nanoscale: Local structuring of phase change materials using focused ion beam

12:30-12:55 Invited Speaker: Otto Muskens – University of Southampton, United Kingdom
Programmable and reconfigurable nanophotonics using the low-loss phase change material Sb_2Se_3

12:55-13:00 GROUP PHOTO

13:00-15:00 LUNCH BREAK & POSTER PRESENTATIONS

SESSION 3 - DRIFT

15:00-15:25 Invited Speaker: Ghazi Sarwat Syed – IBM Research - Zurich, Switzerland
Chalcogenide Computational Memory

15:25-15:40 Benedikt Kersting – IBM Research Europe, Switzerland
Many-body thermal excitation and the collective relaxation model

15:40-15:55 Konstantinos Konstantinou – Tampere University, Finland
Intrinsic electron and hole trapping in amorphous phase-change memory materials: connection to resistance drift

15:55-16:10 Nadav Torem – Technion, Israel Institute of Technology, Haifa, Israel
Low Resistance Drift Multi-Level PCM By Constant Amplitude Sub-Nanosecond Reset Pulses

16:10-16:45 COFFEE BREAK

SESSION 4 - IN-MEMORY COMPUTING

16:45-17:10 Invited Speaker: Irem Boybat – IBM Research - Zurich, Switzerland
Temperature sensitivity of phase-change memory-based in-memory computing

17:10-17:35 Invited Speaker: Nicole Saulnier – IBM Research, New York, USA
Integration of PCM in 14nm for analog in-memory computing

17:35-17:50 Bokusui Nakayama – Keio University, Japan
Mimicking the Pheromone Communication of Ant Swarm with Colloids and Phase Change Material

Programme - Tuesday 20 September 2022

All timings are in local British Summer Time (BST)

08:30-09:00 REGISTRATION + MORNING REFRESHMENTS

SESSION 5 - THEORY

09:00-09:25 Invited Speaker: Riccardo Mazzarello – University of Rome, Italy
Atomistic study of the configurational entropy of supercooled liquid GeTe

09:25-09:40 Wei Zhang – Xi'an Jiaotong University, China
Unraveling crystallization mechanisms and electronic structure of Ge-Sb-Te alloys by ab initio simulations

09:40-09:55 Stephen Elliott – University of Cambridge, United Kingdom
Hyperbonding in telluride memory materials

09:55-10:10 Carl-Friedrich Schön – RWTH Aachen University, Germany
Chemical Bonding revisited: The Potential of Property Maps

10:10-10:25 Matthias Wuttig – RWTH Aachen University, Germany
Phase Change Materials by Design: Developing Treasure Maps with Quantum Chemistry

10:25-10:40 Xian-Bin Li – Jilin University, China
Entropy barrier controlled ultrafast reversible ferroelectric phase change in 2D III2-VI3 materials

10:40-11:15 COFFEE BREAK

SESSION 6 - GE-RICH GST

11:15-11:40 Invited Speaker: Marco Bernasconi – Università di Milano-Bicocca, Italy
Atomistic simulations of the crystallization kinetics: Sb in confined geometry and asdep GeTe

11:40-11:55 Eloïse Rahier – CEMES-CNRS/STMicroelectronics, France
Crystallization mechanism of Ge-rich GST unveiled by in-situ synchrotron XRD and (S)TEM

11:55-12:10 Elisa Petroni – STMicroelectronics, Italy
Advanced metrics for quantification of by-process segregation beyond ternary systems

12:10-12:35 Invited Speaker: Stefano Cecchi – Università di Milano-Bicocca, Italy
Exploration of epitaxial GeSbTe alloys with Ge-rich composition for automotive applications

12:35-12:50 Sabrina Calvi – University of Rome Tor Vergata, Italy
Ge-Sb-Te alloys on free-standing flexible substrates

12:50-14:50 LUNCH BREAK & POSTER PRESENTATIONS

SESSION 7 - ePCM

14:50-15:15 Invited Speaker: Andrea Redaelli – STMicroelectronics, Italy
ePCM applications and related material challenges

15:15-15:30 Martina Tomelleri – CEA-LETI/STMicroelectronics, Grenoble, France
Investigation of N-doped $GeSe_{0.5}Te_{0.5}$ films for Embedded Phase-Change Memories

15:30-15:45 Fabrizio Arciprete – University of Rome Tor Vergata, Italy
Electronic properties, interface formation and Sb confinement in In-based PCM heterostructures

15:45-16:10 Invited Speaker: Pierre Noé – CEA/LETI, Grenoble, France
Phase-Change and Ovonic Chalcogenide Materials: Unique and Uncommon Physical Properties behind Innovative Electronic and Photonic Devices

16:10-16:45 COFFEE BREAK

SESSION 8 - THERMAL ENGINEERING

16:45-17:10 Invited Speaker: Rossella Ranica – STMicroelectronics, France
Optimization of heater system in ePCM for robust reliability and scalability in 28nm FDSOI technology

17:10-17:25 Rob Simpson – Singapore University of Technology and Design, Singapore
Thermally Engineered Phase Change Materials and Superlattices

17:25-17:50 Invited Speaker: Eric Pop – Stanford University
Thermal Confinement and Low-Power Memory Devices Based on Superlattice Chalcongenides

19:30 GALA DINNER AT BALLIOL COLLEGE

Programme - Wednesday 21 September 2022

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08:00-08:40	MORNING REFRESHMENTS
SESSION 9 – OTS & MULTILAYERS	
08:40-09:05	Invited Speaker: Elia Ambrosi – Taiwan Semiconductor Manufacturing Company Ltd, Taiwan *Reliability and performance improvement of arsenic-free low voltage chalcogenide selectors*
09:05-09:20	Chanyoung Yoo – Seoul National University, Korea *Atomic Layer Deposition of GeTe/Sb_2Te_3 Superlattice and Its Switching Mechanism*
09:20-09:35	Michelle Huai-Yu Cheng – Macronix International Co. Ltd, Taiwan *Multilayer InAsSeGe OTS Selectors Engineering for High Thermal Stability and Improved Endurance 3D Crosspoint Memory*
09:35-10:00	Invited Speaker: Hyunsang Hwang – Pohang University of Science and Technology (POSTECH), Korea *Effect of Microwave Annealing on Ovonic Threshold Switching Device*
10:00-10:35	COFFEE BREAK
SESSION 10 – OTS & MULTILAYERS	
10:35-11:00	Invited Speaker: Taras Ravsher – KU Leuven & IMEC, Belgium *Polarity-dependent effects in OTS materials and their application as self-selective memory*
11:00-11:15	Damien Terebenec – CEA-LETI, France *PCM Heterostructures for Low Power Phase-Change Memory: from multilayers to van de Waals stacks*
11:15-11:30	Vitomir Sever – CEA-LETI, France *HAADF-STEM analysis of the local structure of GeTe-Sb_2Te_3 heterostructures obtained by van der Waals epitaxy*
11:30-11:45	Jaemin Park – Korea University, Korea *Sb_2Te_3/$TiTe_2$ superlattice based phase change memory*
11:45-12:10	Invited Speaker: Min Zhu – Shanghai Institute of Micro-System and Information Technology, China *Single-Element Switch*
12:10-12:30	BREAK
12:30-13:00	**AWARD CEREMONY & CLOSING**
13:00-14:00	LUNCH & END

Poster Index

Poster Index